Owner's Guide and Installation Instructions

Continuous Flow Gas Water Heater

244 series

027 models

VULCAN

This water heater must be installed and serviced by a qualified person.
Please leave this guide with the householder.

⚠ **Warning:** Upon completion of the installation and commissioning of the water heater, leave this guide with the householder or a responsible officer. **DO NOT** leave this guide inside of the cover of the water heater, as it may interfere with the safe operation of the water heater or ignite when the water heater is turned on.

PATENTS

This water heater may be protected by one or more patents or registered designs in the name of Rheem Australia Pty Ltd or Paloma Co., Ltd.

Rheem Australia Pty Ltd is the supplier of the Vulcan range of continuous flow gas water heaters, manufactured by Paloma Co., Ltd., a world leader in water heater technology and manufacture.

TRADEMARKS

® Registered trademark of Rheem Australia Pty Ltd.
™ Trademark of Rheem Australia Pty Ltd.

Note: Every care has been taken to ensure accuracy in preparation of this publication.
No liability can be accepted for any consequences, which may arise as a result of its application.

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The other pages are intended for the installer but may be of interest.

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ABOUT YOUR WATER HEATER

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

MODEL TYPE

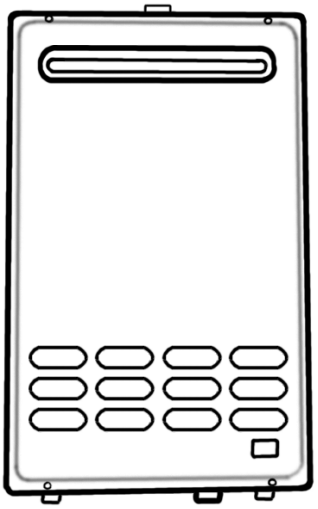
The Vulcan® continuous flow water heater model you have chosen is for outdoor installation only.

This water heater has been installed as an in-series gas booster to a solar water heater. For information relating to the function and operation of the solar water heater, refer to the Owner's Guide and Installation Instructions supplied with the solar water heater.

GAS BOOSTING FOR A SOLAR WATER HEATER

Water stored in the solar storage tank passes through the in-series gas booster when a hot tap is opened. The in-series gas booster is for heating water at times of low solar energy gain, such as during cloudy or rainy weather, or during colder months.

Solar heated water can reach temperatures up to 70°C to 80°C for a Vulcan solar direct or indirect pumped system and possibly higher for some other models of solar water heaters. The in-series gas booster operates automatically. When the solar heated water temperature is 58°C or higher, the flow passes through the in-series gas booster without boosting. When the solar heated water temperature is below 58°C, the in-series gas booster heats the water to its preset outlet temperature setting.



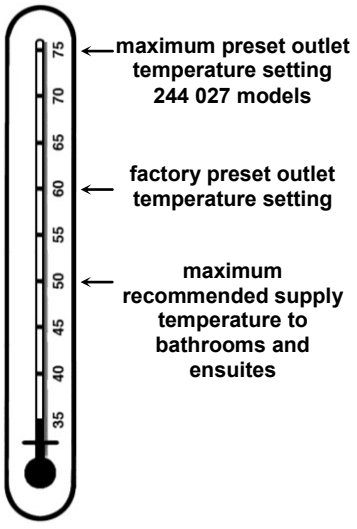
WATER HEATER OPERATION

The water heater operates automatically if heating of the water is required. When a hot tap is opened and the solar heated water temperature is below 58°C, the gas burners ignite to provide immediate heating of the water to its preset outlet temperature setting as the water passes through the water heater. The heat produced by the burner is transferred to the water through the heat exchanger. The water is heated to a constant temperature by the automatic adjustment of the gas supply to the burner to suit the water flow rate. The gas burners extinguish when the hot tap is closed.

Automatic safety controls are fitted to the water heater to provide safe and efficient operation.

HOW HOT SHOULD THE WATER BE?

The solar water heater will deliver water at temperatures up to 70°C to 80°C for a Vulcan solar direct or indirect pumped system and possibly higher for some other models of solar water heaters.



During periods of low solar energy gain, the in-series gas booster will boost the water temperature automatically to its preset outlet temperature setting. The factory preset outlet temperature setting is 60°C.

Note: The preset outlet temperature setting of this water heater cannot be adjusted by the householder. The setting can only be adjusted by the installer, Rheem Service or their nearest Accredited Service Agent.

Note: AS 3498 requires that a water heater provides the means to inhibit the growth of Legionella bacteria in potable water. When this water heater is used as an in-series booster for a solar water heater it can satisfy this AS 3498 requirement provided it is energised, the booster preset outlet temperature setting is 70°C or higher, and that a remote temperature controller is not used.

⚠ **Warning:** Temperature controllers **must not** be fitted to this water heater as part of a solar water heater system because water at a temperature much higher than the controller setting can be delivered.

MAINS PRESSURE

The water heater is designed for direct connection to the mains water supply. If the mains supply pressure in your area exceeds that shown on page 16, a pressure limiting valve must be fitted. The supply pressure should be greater than 140 kPa for the rated flow and performance to be achieved.

HOTTER WATER INCREASES THE RISK OF SCALD INJURY

This water heater can deliver water at temperatures which can cause scalding. Check the water temperature before use, such as when entering a shower or filling a bath or basin, to ensure it is suitable for the application and will not cause scald injury.

We recommend and it may be required by regulations that an approved temperature limiting device be fitted into the hot water piping to the bathroom and ensuite when this water heater is installed. This will keep the water temperature below 50°C at the bathroom and ensuite. The risk of scald injury will be reduced and still allow hotter water to the kitchen and laundry.

⚠ WARNING

This water heater is only intended to be operated by persons who have the experience or the knowledge and the capabilities to do so. This water heater is not intended to be operated by persons with reduced physical, sensory or mental capabilities i.e. the infirm, or by children. Children should be supervised to ensure they do not interfere with the water heater.

The water heater uses 240 Volt AC electrical power for operation of the control systems and the combustion fan. The removal of the front panel will expose 240 V wiring. It must only be removed by a qualified person.

The power lead from the water heater must be plugged into a weatherproof electrical outlet. Take care not to touch the power plug with wet hands.

SAFETY

This water heater is supplied with temperature sensors, a FlameSafe® protection system and a pressure relief valve. These devices must not be tampered with or removed. The water heater must not be operated unless each of these devices is fitted and is in working order.

If the power supply cord or plug is damaged, it must be replaced by a qualified person in order to avoid a hazard. The power supply cord and plug must be replaced with a genuine replacement part available from Rheem. Phone Rheem Service or their nearest Accredited Service Agent to arrange for an inspection.

⚠ **Warning:** For continued safety of this water heater it must be installed, operated and maintained in accordance with the Owner's Guide and Installation Instructions.

The Vulcan warranty may not cover faults if relief valves or other safety devices are tampered with or if the installation is not in accordance with these instructions.

- Do not store **flammable or combustible materials** near the water heater. Flammable liquids (such as petrol), newspapers and similar articles must be kept well away from the water heater and the flue terminal.
- Do not use **aerosols, stain removers and household chemicals** near the water heater whilst it is working. Gases from some aerosol sprays, stain removers and household chemicals become corrosive when drawn into a flame.
- Do not store **swimming pool chemicals, household cleaners,** etc., near the water heater.
- Do not place anything on top of the water heater or in contact with the flue terminal. Ensure the flue terminal is not obstructed in any way at any time.

- Do not use Propane / Butane gas mixtures in a Propane model. A Propane model is designed to operate on Propane only. The use of Propane / Butane mixture, such as automotive LPG fuel, in a Propane model is unsafe and can cause damage to the water heater.

PRECAUTIONS

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed over a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements.

The water heater must be maintained in accordance with the Owner's Guide and Installation Instructions. Refer to "General Maintenance" on page 6, "Minor Six Month Maintenance" on page 6 and "Annual Service" on page 6.

If this water heater is to be used where an uninterrupted hot water supply is necessary for your application or business you should ensure that you have back up redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater were to become inoperable for any reason. We recommend you seek advice from your plumber or specifier about your needs and building back up redundancy into your hot water supply system.

GENERAL MAINTENANCE

The jacket of the water heater can be cleaned with a soft cloth and warm mild soapy water. Under no circumstances should abrasive materials or powders be used.

The area around the water heater can be sprayed with insecticide to rid the area of insects. Insects encroaching into or nesting in the water heater can interfere with the operation of the water heater and also damage components.

MINOR SIX MONTH MAINTENANCE

It is recommended minor maintenance be performed every six months by the dwelling occupant.

The minor maintenance includes:

- Inspect around the air inlet, flue terminal and the water heater in general for plant growth.
  - Trim back any shrubs, bushes or other plants which have encroached around the water heater.

    Plant growth across the air let and flue terminal can interfere with the performance of the water heater.
- Inspect around the water heater for insect infestations, such as ants.
  - Spray insecticide around the water heater if necessary to rid the area of insects. Do not spray the surface or into the air inlet or flue terminal of the water heater.

    Insects encroaching into or nesting in the water heater can interfere with the operation of the water heater and also damage components.
- Check the drain line from the safe tray (if one is installed) is not blocked.

ANNUAL SERVICE

For safe and efficient operation, it is recommended an annual service be conducted on the water heater. Only genuine replacement parts should be used on this water heater.

⚠ **Warning**: Servicing of a water heater must only be carried out by qualified personnel. Phone Rheem Service or their nearest Accredited Service Agent.

The annual service includes the following actions:

- Check and if necessary adjust the gas pressure.
- Check the operation of and clean the burner.
- Visually check the unit for any potential problems.
- Inspect all connections.
- Check the drain line from the safe tray (if one is installed) is not blocked.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater:

- Switch off the electrical supply at the power outlet to the water heater if there is no risk of freezing conditions occurring (refer to note below).
- Close the gas isolation valve at the inlet to the water heater.
- Close the solar preheat water isolation valve at the inlet to the water heater.

Note: If there is a risk of freezing conditions, the electrical supply to the water heater should not be switched off unless the water heater is drained, otherwise damage could result (refer to "Frost Protection" on page 8 and "Draining the Water Heater" on page 8).

TO TURN ON THE WATER HEATER

- Screw in the drain plugs at the solar heated water inlet and hot water outlet of the water heater if the water heater has been drained.
- Open all of the hot taps in the house (don't forget the shower).
- Open the cold water isolation valve fully at the inlet to the solar water heater.
- Open the solar heated water isolation valve fully at the inlet to the in-series gas booster.

  Air will be forced out of the taps.
- Close each tap as water flows freely from it.
- Open the gas isolation valve fully at the inlet to the water heater.
- Plug in the power supply cord at the power outlet.
- Switch on the electrical supply at the power outlet to the water heater.

The water heater will operate automatically when you open a hot tap if boosting is required.

GOING ON HOLIDAYS

If you are going on holidays, it is not necessary to turn the water heater off. If it is necessary to turn off the water heater, refer to "To Turn Off The Water Heater" on page 7.

FROST PROTECTION

The in-series gas booster has a frost protection system. The frost protection system will protect the in-series gas booster from damage, by preventing ice forming in the waterways of the in-series gas booster, in the event of freezing conditions occurring.

Notes:

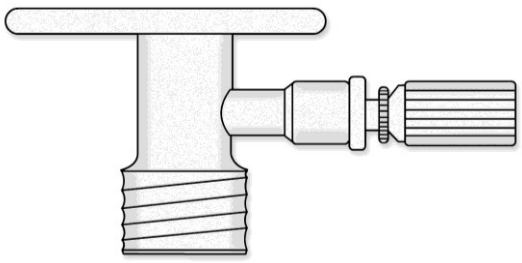
- The frost protection system will be rendered inoperable if electrical power is not available at the water heater. Damage caused by freezing due to the unavailability of power at the water heater is not covered by the Vulcan warranty (refer to "Terms of the Vulcan Warranty" on page 31).
- If it is necessary to switch the power off to the water heater and there is a risk of freezing, then it is necessary to drain the water heater (refer to "Draining the Water Heater" on page 8).
- Pipe work to and from the water heater must be adequately insulated to prevent freezing.
- The water heater is not suitable for installation in areas where the ambient temperature falls below -20°C (including wind chill factor).
- Refer to "Terms of the Vulcan Warranty" on page 31.

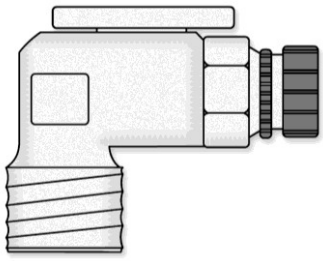
DRAINING THE WATER HEATER

- Turn off the water heater (refer to "Turn Off The Water Heater" on page 7).
- Open a hot tap (preferably the shower outlet).
- Unscrew the two drain plugs, one each at the solar heated water inlet and hot water outlet, on the underside of the water heater.

  Water will drain from the water heater.
- When water stops flowing from the water heater, close the hot tap.

Note: It is recommended not to screw the drain plugs back in, until the water heater is to be turned on again.





HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

Installation requirements are shown on pages 14 to 21. The water heater must be installed:

- by a qualified person, and
- in accordance with the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS 5601 or AS/NZS 5601.1, as applicable under local regulations, and all local codes and regulatory authority requirements.

⚠ **Warning:** Temperature controllers **must not** be fitted to this water heater as part of a solar water heater system because water at a temperature much higher than the controller setting can be delivered.

The pipe work between the solar storage tank and the in-series gas booster has a minimum recommended pipe size of DN20, **MUST BE** of copper and be fully insulated in accordance with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. The insulation must be fitted up to the connections on both the solar storage tank and the in-series gas booster.

VICTORIAN CUSTOMERS

Notice to Victorian Customers from the Victorian Plumbing Industry Commission. This water heater must be installed by a licensed person as required by the Victorian Building Act 1993.

Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant Standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

DOES THE WATER CHEMISTRY AFFECT THE WATER HEATER?

The water heater is suitable for most public water supplies, however some water chemistries may have detrimental effects on the water heater, its components and fittings. Refer to “Water Supplies” on page 10.

If you are in a known harsh water area or you are not sure of your water chemistry, have your water checked against the conditions described on page 10.

HOW LONG WILL THE WATER HEATER LAST?

The water heater is supported by a manufacturer’s warranty (refer to page 31). There are a number of factors that will affect the length of service the water heater will provide. These include but are not limited to the water chemistry, the water pressure, the water temperature (inlet and outlet) and the water usage pattern. Refer to “Precautions” on page 6.

WATER SUPPLIES

This water heater must be installed in accordance with this advice to be covered by the Vulcan warranty.

This water heater is manufactured to suit the water conditions of most public reticulated water supplies. However, there are some known water chemistries which can have detrimental effects on the water heater and its operation and / or life expectancy. If you are unsure of your water chemistry, you may be able to obtain information from your local water supply authority. This water heater should only be connected to a water supply which complies with these guidelines for the Vulcan warranty to apply.

CHANGE OF WATER SUPPLY

The changing or alternating from one water supply to another can have a detrimental effect on the operation and / or life expectation of a heat exchanger in a continuous flow water heater.

Where there is a changeover from one water supply to another, e.g. a rainwater tank supply, bore water supply, desalinated water supply, public reticulated water supply or water brought in from another supply, then water chemistry information should be sought from the supplier or it should be tested to ensure the water supply meets the requirements given in these guidelines for the Vulcan warranty to apply.

SATURATION INDEX

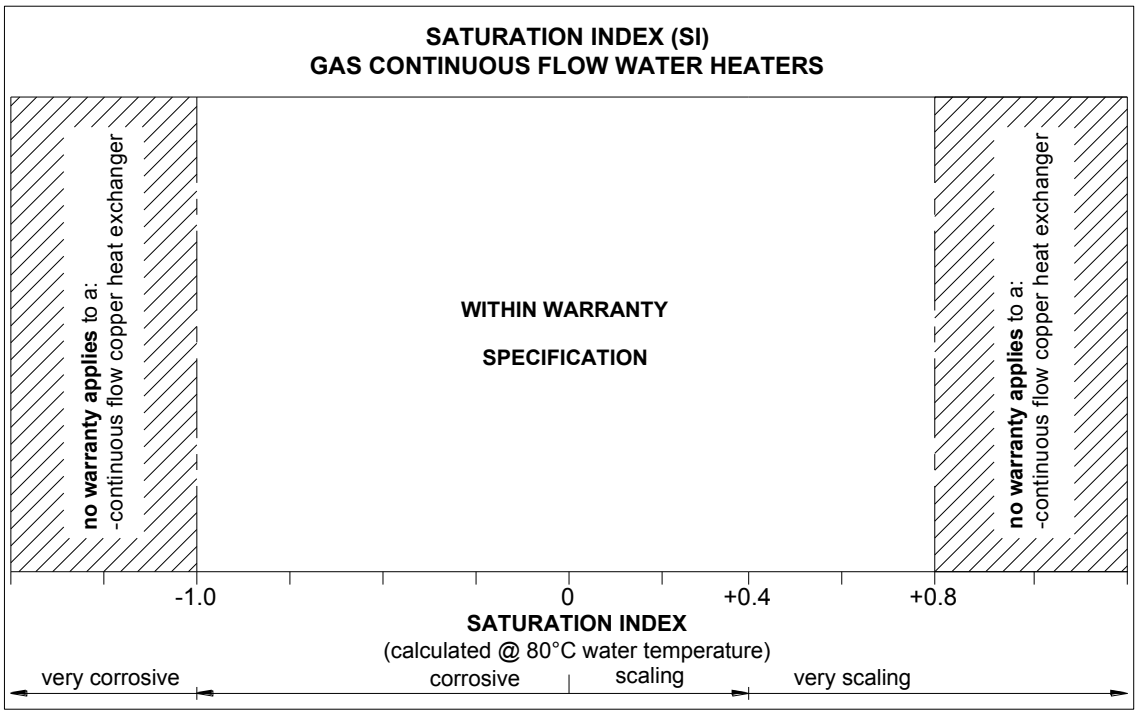
The saturation index (SI) is used as a measure of the water's corrosive or scaling properties.

In a corrosive water supply, the water can attack copper parts and cause them to fail. Where the saturation index is less than –1.0, the water is very corrosive and the Vulcan warranty does not apply to a copper heat exchanger in a continuous flow water heater.

In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. Where the saturation index exceeds +0.80, the Vulcan warranty does not apply to a copper heat exchanger in a continuous flow water heater.

Water which is scaling may be treated with a water softening device to reduce the saturation index of the water.

Refer to the Saturation Index chart on page 10.



SAVE A SERVICE CALL

Check the items below before making a service call. You will be charged for attending to any condition or fault, which is not related to manufacture or failure of a part (refer to "Terms of the Vulcan Warranty" on page 31).

COLD WATER FROM THE HOT TAP

- Close the hot tap, wait 10 seconds and open the hot tap again.
- Is the hot tap open enough?

  The burners will not light if the flow rate is less than 2.0 L / min.
- Is the water heater plugged in and the power outlet switched on?
- Is power available in the house?

  Try using another electrical appliance.
- Is the isolation valve in the gas line open?
- Is there a gas supply to the rest of the house?

  Try lighting another gas appliance.
- Has the gas line been purged of air after installation?

  Refer to your plumber.

NO WATER FROM THE HOT TAP

No flow of water from the hot tap may indicate a restriction in or failure of the cold water supply to the water heater. Check for water flow at other taps and that the cold water isolation valve (refer to page 22) is fully open.

WATER FLOW FLUCTUATES

More than two or three hot taps in use at the same time may cause a decrease in the hot water flow from the taps if the in-series gas booster is operating and the solar heated water is at a low temperature.

- Are there more than two or three taps open, or are appliances such as a dishwasher or washing machine, in use at the same time?

  Ensure only two or three taps or appliances are on at the one time.
- Check the flow of the water from one tap, eg, the shower.

  The shower should be adjusted so the hot tap is fully open.

GAS BOOSTER OPERATING TOO FREQUENTLY

You may find that the in-series gas booster operates more frequently than expected. This will occur when the solar heated water temperature is lower than 58°C, which may be experienced during periods of low solar energy gain or if there has been heavy hot water usage. Factors to consider are:

- **Hot tap not used recently**
  If a hot tap has not been used for a while, the water in the pipe work between the solar storage tank and the in-series gas booster may have cooled down. The in-series gas booster will sense the cooler water and this will cause the burners on the water heater to ignite and boost the water temperature when a hot tap is first turned on. The burners will extinguish when solar heated water of 58°C or higher from the solar storage tank reaches the in-series gas booster (refer also to "Fan Continues to Run after Water Heater Operation Stops" on page 12).

- **Insufficient sunlight**
  Insufficient sunlight due to cloudy weather during hotter months or low solar energy contribution in colder months may mean the in-series gas booster operates more often.

- **Collectors shaded**
  If trees or other objects shade the solar collectors or if the glass is dirty, the effectiveness of the solar collectors will be greatly reduced. Have the trees trimmed or the solar collectors relocated if the obstruction is permanent or clean the collector glass.

  Ensure the glass on your solar collectors is free of dust, salt spray or any other matter, which may reduce the effectiveness of the solar collectors. If the collector glass becomes dirty, hose down or if the solar collectors are accessible, wash the collector glass with water and a soft brush when the solar collectors are cool.

- **Collector area is too small**
  For most installations, the number of solar collectors recommended in Vulcan literature has been proven to provide the required solar energy to meet the average family needs. However, in some circumstances, it may be necessary to install an additional solar collector.

- **Are you using more hot water than you think?**
  Is one outlet (especially the shower) using more hot water than you think?

  Very often it is not realised the amount of hot water used, particularly when showering. Carefully review the family's hot water usage. As you have installed an energy saving appliance, energy saving should also be practised in the home. Adjust your water usage pattern to take advantage of maximum solar gains.

  Have your plumber install a flow control valve to each shower outlet, basin and sink to reduce water usage.

- **Water heater size**
  Do you have the correct size water heater for your requirements?

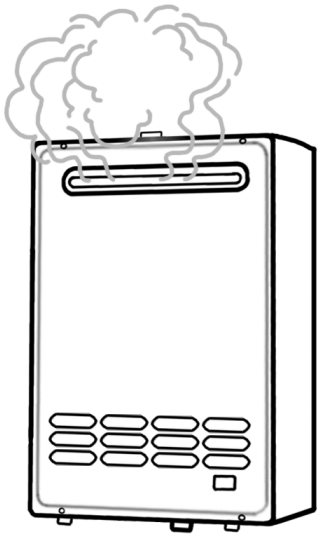
  The sizing guide in the sales literature suggests average sizes that may be needed.

FAN CONTINUES TO RUN AFTER WATER HEATER OPERATION STOPS

It is the normal operation of the water heater for the fan to continue running after heating of the water is finished. The fan may run for up to six minutes after the burners extinguish, to prepare for the next ignition.

CLOUDS OF WHITE 'VAPOUR' FROM THE FLUE TERMINAL

During the heating cycle, it is not unusual to see water vapour clouds steaming from the flue terminal, particularly on cold days. This is normal operation of the water heater.



PRESSURE RELIEF VALVE DISCHARGING

A pressure relief valve is incorporated into the water heater controls. This valve protects the water heater, by allowing water to escape, in the event of excessive pressure build up in the waterways.

- **Normal operation**
  A small volume of water may discharge from the bottom of the water heater when a hot tap is suddenly closed.
- **Continuous dribble**
  A continuous dribble may indicate the water supply pressure is above the design pressure for the water heater. If so, a pressure limiting valve must be installed on the cold water supply pipe to the water heater (refer to "Mains Water Supply" on page 16).

ERROR CODE

The water heater provides a diagnostic error code in the event of an interruption to its operation. The error code is displayed on the OK MONITOR on the front of the water heater as a numerical value. If an error code appears:

- Close the hot tap and switch off the electrical supply to the water heater.
- Check the gas isolation valve at the gas inlet to the water heater is fully open.
- Wait 5 minutes, then switch on the electrical supply to the water heater and open a hot tap.

If the error code persists, take note of the numerical code and turn off the hot tap. Phone Rheem Service or their nearest Accredited Service Agent to arrange for inspection.

HIGHER THAN EXPECTED GAS BILLS

Should you at any time, feel your gas account is higher than expected, we suggest you check the following points:

- Is one outlet (especially the shower) using more hot water than you think?

  Carefully review the family's hot water usage. Inexpensive flow control valves can be easily fitted to the shower outlets to reduce water usage.
- Is the in-series gas booster operating too frequently?

  Refer to "Gas Booster Operating Too Frequently" on page 12.
- Has there been an increase in hot water usage?

  An increase in hot water usage may result in an increase in booster operation.

- Has your water heating tariff rate been increased by your gas retailer since your previous account?

IF YOU HAVE CHECKED ALL THE FOREGOING AND STILL BELIEVE YOU NEED ASSISTANCE, PHONE RHEEM SERVICE OR THEIR NEAREST ACCREDITED SERVICE AGENT.

INSTALLATION – WATER HEATER

THIS WATER HEATER IS FOR OUTDOOR INSTALLATION ONLY.
THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING.
Check the water heater is suitable for the gas type available.
(refer to the rating label on the water heater)

INSTALLATION STANDARDS

The water heater must be installed:

- by a qualified person, and
- in accordance with the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS 5601 or AS/NZS 5601.1, as applicable under local regulations, and all local codes and regulatory authority requirements.

All packaging must be removed from the water heater prior to its installation.

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

If this water heater is to be used where an uninterrupted hot water supply is necessary for the application or business, then there should be redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater was to become inoperable for any reason. We recommend you provide advice to the system owner about their needs and building backup redundancy into the hot water supply system.

This water heater is suitable for installation as an in-series gas booster to a solar water heater. For information relating to the function and operation of the solar water heater, refer to the Owner's Guide and Installation Instructions supplied with the solar water heater.

The factory preset outlet temperature setting of the in-series gas booster is 60°C. The preset outlet temperature setting can be adjusted (refer to "Preset Outlet Temperature Setting" on page 28).

Note: AS 3498 requires that a water heater provides the means to inhibit the growth of Legionella bacteria in potable water. When this water heater is used as an in-series booster for a solar water heater it can satisfy this AS 3498 requirement provided it is energised, the booster preset outlet temperature setting is 70°C or higher, and that a remote temperature controller is not used.

WATER HEATER LOCATION

The water heater should be installed close to the most frequently used outlet and the solar storage tank, with its position chosen with safety and service in mind. Make sure people (particularly children) will not touch the flue terminal. The flue terminal and air inlet must be clear of obstructions and shrubbery.

Clearance must be allowed for servicing of the water heater. The water heater must be accessible without the use of a ladder or scaffold. Make sure the entire front panel can be removed for service. You must be able to read the information on the rating plate. Remember you may have to take the entire water heater out later for servicing.

This water heater must be installed vertically upright with the water, gas and power connections on the underside, pointing toward the ground. The back of the water heater can be either against a wall or supported by a frame. The water heater must be secured to the wall or frame using either the screws provided or other mounting screws suitable for the application, two each at the top and bottom of the unit (refer to page 20 for mounting hole positions). Alternatively the water heater can be recessed into a wall (refer to "Recess Installation" on page 16).

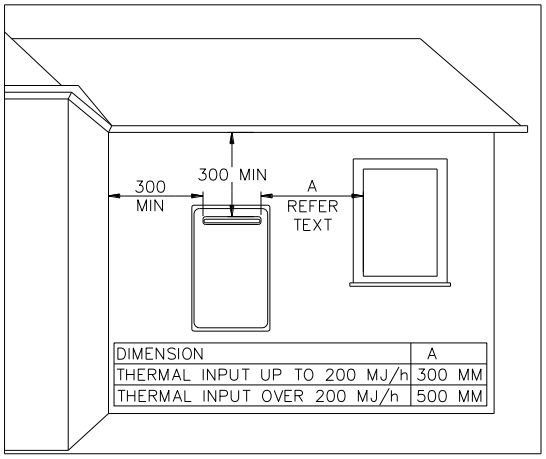
For a single water heater installation, refer to the typical installation diagram on page 21.

The water heater must not be installed in an area with a corrosive atmosphere where chemicals are stored or where aerosol propellants are released. Remember the air may be safe to breathe, but when it goes through a flame, chemical changes take place which may attack the water heater.

A secondary flue is not required. The water heater must not be installed indoors or in a confined space.

The water heater must be located to ensure that the location of the flue terminal complies with the requirements of AS 5601 or AS/NZS 5601.1, as applicable under local regulations. As a guide the following requirements are extracted from the Gas Installations Standard. The distances are measured along the wall behind the water heater.

- At least 300 mm between the top of the flue terminal and the eaves.
- At least 500 mm between the flue terminal and the edge of any opening into the building, such as an openable door or window, measured horizontally*.
- At least 1500 mm between the top of the flue terminal and the edge of any opening into the building, such as an openable window, measured vertically.
- At least 300 mm between the flue terminal and a return wall or external corner, measured horizontally*.
- At least 1500 mm between the flue terminal and any opening into a building, in the direction of the flue discharge.



- At least 500 mm between the flue terminal and a fence, wall or other obstruction, in the direction of the flue discharge.

Note: * If these horizontal distances cannot be achieved, AS/NZS 5601.1 states an equivalent horizontal distance measured diagonally from the nearest discharge point of the flue terminal to the opening may be deemed to comply. Check with the local regulator.

SAFE TRAY

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed over a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements.

PIPE COVER

The pipe work to the water heater can be housed within a pipe cover. A pipe cover kit (PN 299829) is available for such an installation. Refer to the installation instructions which accompany the pipe cover kit.

RECESS INSTALLATION

The water heater can be installed recessed into a wall. A recess box (PN 299831) is available for such an installation. Refer to the installation instructions which accompany the recess box kit for information on its installation.

An additional rating label is supplied attached to the inside of the front cover of the water heater. This is for a service person to access the water heater details when required. The rating plate on the side of the water heater should be moved to or the information copied onto either the front panel of the water heater or to another position which is visible when the water heater is installed so the householder can access the water heater details when required.

FROST PROTECTION

The in-series gas booster has a frost protection system. The frost protection system will protect the in-series gas booster from damage, by preventing ice forming in the waterways of the in-series gas booster, in the event of freezing conditions occurring.

The frost protection system will be rendered inoperable if electrical power is not available at the water heater. Damage to the water heater caused by freezing of the pipe work to or from the water heater is not covered under the Vulcan warranty. Refer to AS/NZS 3500.4 for precautions to be taken for installations in frost prone areas. The water heater is not suitable for installation in areas where the ambient temperature falls below -20°C (including wind chill factor).

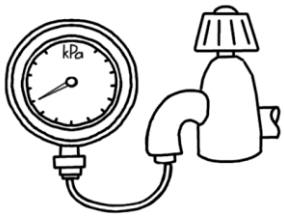
The solar preheat line to the water heater must be insulated with suitable thickness insulation if freezing conditions are likely to occur. The insulation must be fitted to the underside of the water heater and be weatherproof and UV resistant if exposed.

MAINS WATER SUPPLY

Where the mains water supply pressure exceeds that shown in the table below, an approved pressure limiting valve is required and should be fitted prior to the solar storage tank. The solar storage tank may have a lower mains supply pressure requirement, which would govern the maximum supply pressure to the system.

Model	027
Relief valve setting	1750 kPa
Max. mains supply pressure	1000 kPa
Min. mains supply pressure *	140 kPa

* minimum water supply pressure required to achieve the rated flow and performance



Notes:

- It is not recommended to install this water heater with a low pressure water supply.
- A minimum water supply pressure of 140 kPa is required to achieve the rated flow and performance of the water heater.
- The maximum water supply pressure to the solar water heater, without an expansion control valve (ECV), is generally 800 kPa, however it may be less than this for some models. Refer to the Owner's Guide and Installation Instructions supplied with the solar water heater for maximum mains supply pressure details.
- If sludge or foreign matter is present in the water supply, it is recommended a suitable filter be incorporated in the cold water line to the water heater.
- This water heater is not suitable for connection to bore water or spring water unless a water treatment device is fitted.
- Refer to "Water Supplies" on page 10 for further information on water chemistry.

HOT WATER DELIVERY

This water heater can deliver water at temperatures which can cause scalding.

It is necessary and we recommend that a temperature limiting device be fitted between the water heater and the hot water outlets in any ablution and public areas such as a bathroom, ensuite or public amenities, to reduce the risk of scalding. The installing plumber may have a legal obligation to ensure the installation of this water heater meets the delivery water temperature requirements of AS/NZS 3500.4 so that scalding water temperatures are not delivered to a bathroom, ensuite or other ablution or public area.

The temperature limiting device used with a continuous flow gas water heater should have:

- a specified 'minimum temperature differential' between the hot water inlet and the tempered water outlet of no greater than 10°C, and
- a specified 'maximum permitted pressure variation' in the supply between the hot water inlet and the cold water inlet of no less than 15%.

Refer to the specifications of the temperature limiting device.

The temperature limiting device used with an in-series gas booster as part of a solar water heater installation must have the additional capability of receiving a hot water supply temperature of up to 99°C if the solar water heater does not have an over temperature protection system to limit the water to no greater than 90°C.

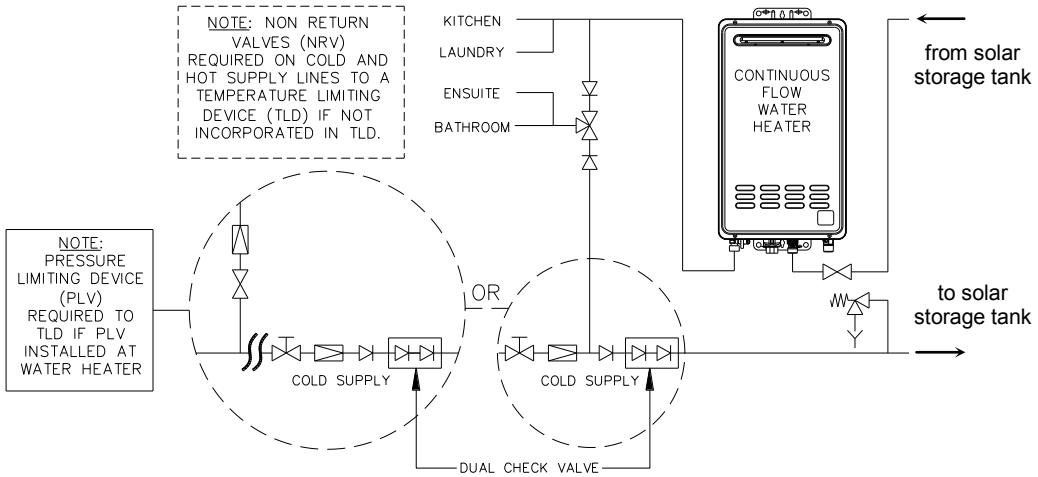
⚠ **Warning:** Temperature controllers **must not** be fitted to this water heater as part of a solar water heater system because water at a temperature much higher than the controller setting can be delivered.

Where a temperature limiting device is installed adjacent to the in-series gas booster, the cold water line to the temperature limiting device can be branched off the cold water line either before or after the isolation valve and pressure limiting valve to the solar storage tank, but it **MUST BE** before the non return valve prior to an open circuit direct system. The cold water line to the temperature limiting device can be branched off the cold water line either before or after the non return valve prior to a closed circuit indirect system. If an expansion control valve is required, it must always be installed after the non return valve and be the last valve prior to the solar storage tank.

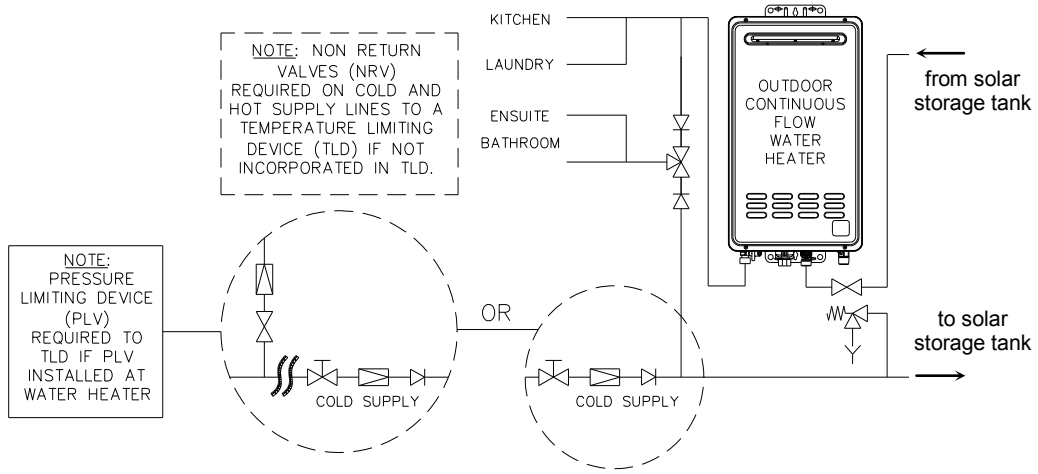
⚠ **Warning:** A non return valve **MUST BE** installed on the cold water line to the solar storage tank **AFTER** the cold water branch to a temperature limiting device prior to an open circuit direct system. Due to the higher water temperatures generated under certain conditions in the solar collectors of an open circuit direct solar water heater, an additional effective back-flow prevention device also should be used as an extra safeguard. Valve manufacturer RMC recommends Dual Check Valve model N7150, as being suitable for this application.

If a combination isolation valve and non return valve (duo or trio valve) is installed on the cold water line to an open circuit direct solar water heater and the cold water line to the temperature limiting device branches off after this valve, then a second non return valve must be installed between the cold water branch and the solar storage tank. Due to the higher water temperatures generated under certain conditions in the solar collectors of an open circuit direct pumped solar water heater, an effective back-flow prevention device should be used as the second non return valve as an extra safeguard. Valve manufacturer RMC recommends Dual Check Valve model N7150, as being suitable for this application.

If a pressure limiting valve is installed on the cold water line to the solar water heater and the cold water line to a temperature limiting device branches off before this valve or from another cold water line in the premises, then a pressure limiting valve of an equal pressure setting may be required prior to the temperature limiting device.


NOTE: NON RETURN VALVES (NRV) REQUIRED ON COLD AND HOT SUPPLY LINES TO A TEMPERATURE LIMITING DEVICE (TLD) IF NOT INCORPORATED IN TLD.
KITCHEN
LAUNDRY
ENSUITE
BATHROOM
CONTINUOUS FLOW WATER HEATER
from solar storage tank
to solar storage tank
NOTE: PRESSURE LIMITING DEVICE (PLV) REQUIRED TO TLD IF PLV INSTALLED AT WATER HEATER
OR
COLD SUPPLY
COLD SUPPLY
DUAL CHECK VALVE

In-series Gas Booster as part of an Open Circuit Direct Solar Water Heater Installation
Two Temperature Zones Using a Temperature Limiting Device


NOTE: NON RETURN VALVES (NRV) REQUIRED ON COLD AND HOT SUPPLY LINES TO A TEMPERATURE LIMITING DEVICE (TLD) IF NOT INCORPORATED IN TLD.
KITCHEN
LAUNDRY
ENSUITE
BATHROOM
OUTDOOR CONTINUOUS FLOW WATER HEATER
from solar storage tank
to solar storage tank
NOTE: PRESSURE LIMITING DEVICE (PLV) REQUIRED TO TLD IF PLV INSTALLED AT WATER HEATER
OR
COLD SUPPLY
COLD SUPPLY

In-series Gas Booster as part of a Closed Circuit Indirect Solar Water Heater Installation
Two Temperature Zones Using a Temperature Limiting Device

CIRCULATED HOT WATER FLOW AND RETURN SYSTEM

A Vulcan 244 series continuous flow water heater can be installed as part of a circulated hot water flow and return system in a building. The preset outlet temperature setting of the water heater must be set to at least 60°C. Water should not be circulated from a water heater with a temperature setting of less than 60°C.

The circulator must be:

- sized and set to provide a minimum flow rate of 3.0 L/min through the recirculated hot water flow and return system, and
- either thermostatically and / or timer controlled.

  The circulator **must not** be set to operate continuously, i.e. 24 hours per day.

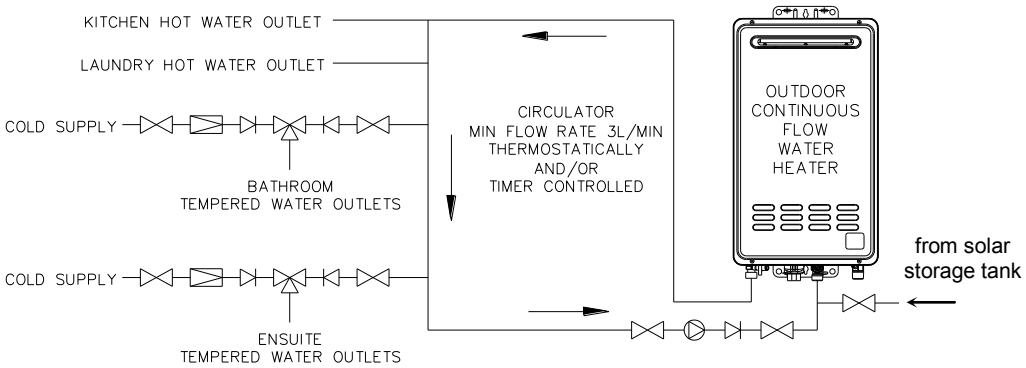
Temperature Limiting Device

A temperature limiting device cannot be installed in circulated hot water flow and return pipe work. The tempered water from a temperature limiting device cannot be circulated. Where a circulated hot water flow and return system is required in a building, a temperature limiting device can only be installed on a dead leg, branching off the circulated hot water flow and return pipe.

If circulated tempered water were to be returned back to the water heater, depending on the location of the return line connection on the water supply line to the water heater, then either:

- water will be supplied to the cold water inlet of the temperature limiting device at a temperature exceeding the maximum recommended water supply temperature, or
- when the hot taps are closed no water will be supplied to the cold water inlet of the temperature limiting device whilst hot water will continue to be supplied to the hot water inlet of the temperature limiting device.

These conditions may result in either water at a temperature exceeding the requirements of AS/NZS 3500.4 being delivered to the hot water outlets in the ablution areas, or the device closing completely and not delivering water at all, or the device failing. Under either condition, the operation and performance of the device cannot be guaranteed.



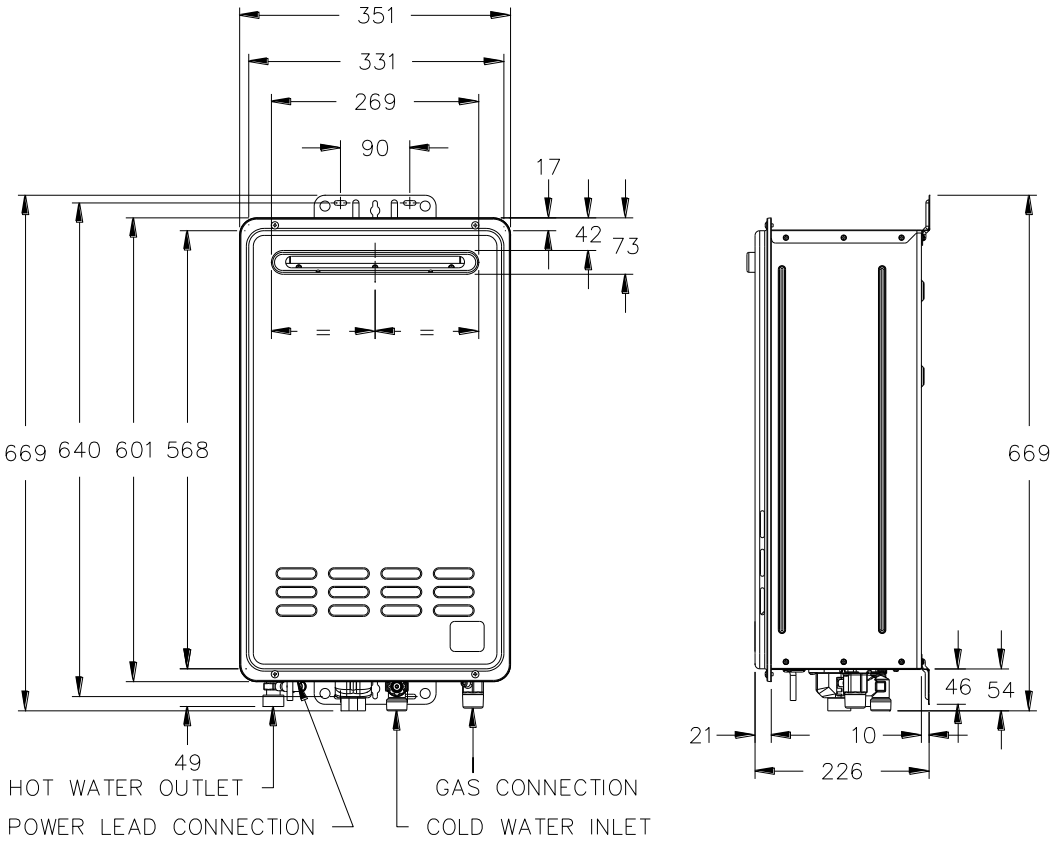
NOTE: A PLV IS REQUIRED TO BE INSTALLED ON THE COLD SUPPLY LINE TO THE TEMPERING VALVE IF A PLV IS INSTALLED ON THE COLD SUPPLY LINE TO THE WATER HEATER.
NON RETURN VALVES (NRV) REQUIRED ON COLD AND HOT SUPPLY LINES TO A TEMPERATURE LIMITING DEVICE (TLD) IF NOT INCORPORATED INTO TLD.

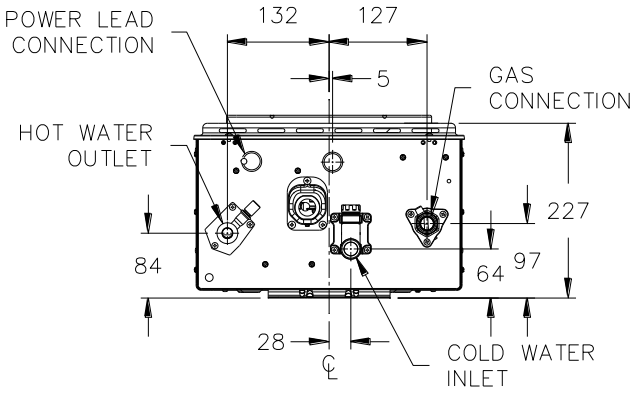
Circulated Hot Water Flow and Return
In-series Gas Booster as part of a Solar Water Heater Installation

REDUCING HEAT LOSSES

The hot water line from the in-series gas booster and the pipe work between the solar storage tank and the in-series gas booster must be insulated in accordance with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. The insulation must be fitted up to the connections on the both the underside of the water heater and the solar storage tank.

DIMENSIONS AND TECHNICAL DATA



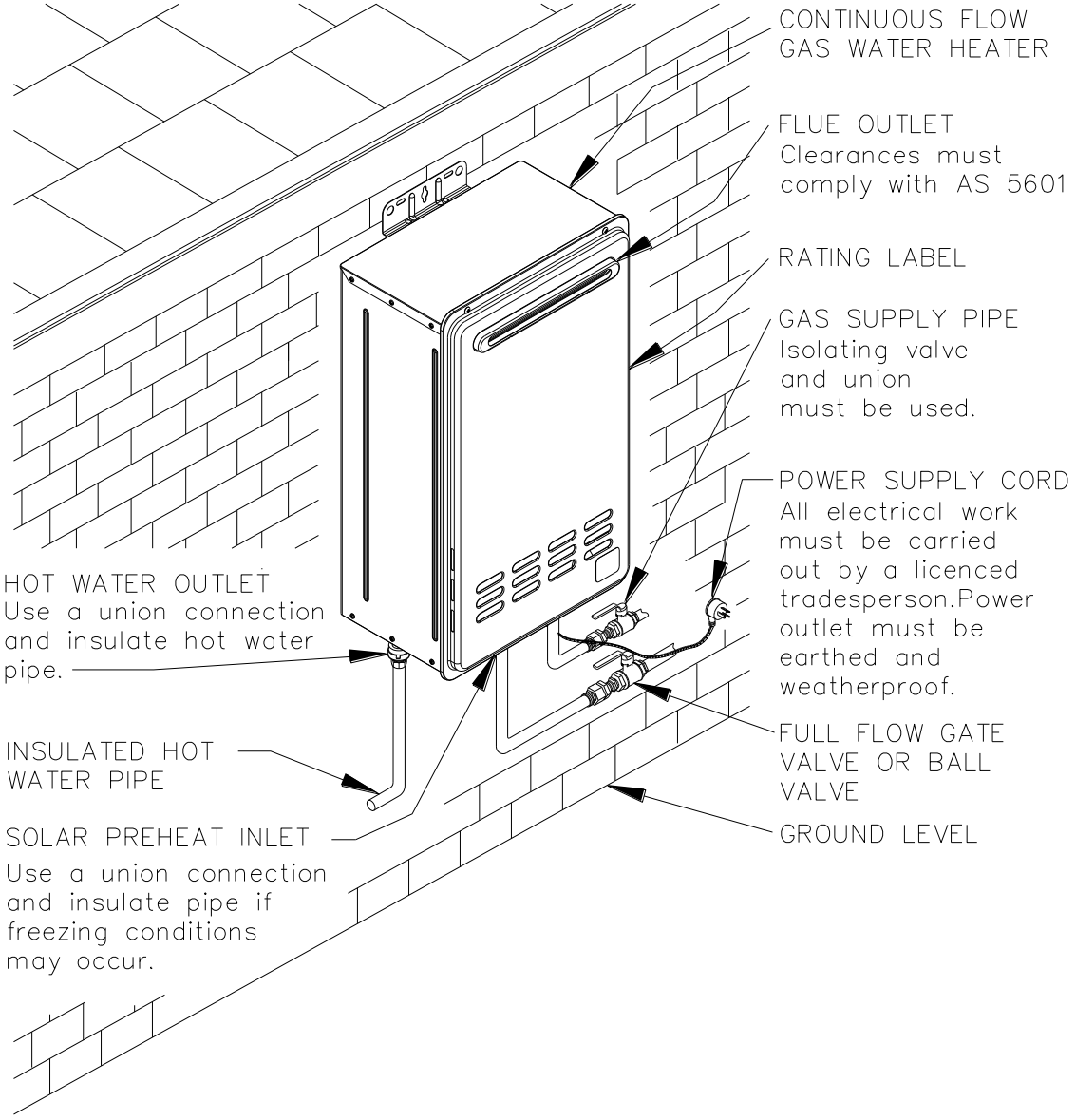


Model			244 027
Rated delivery (@ 40°C rise)		litres / min	16.5
Recovery (@ 25°C rise)		litres / min	27
Mass	Empty	kg	24

Gas Details	Hourly Gas Consumption (MJ)	Min Gas Pressure (kPa)	Test Point Gas Pressure (kPa)		Max Gas Pressure (kPa)
			minimum	maximum	
Model	027	027	027	027	027
Natural	205	1.13	0.193	0.905	3.50
Propane	205	2.75	0.277	1.430	3.50

Model numbers: N = Natural, P = Propane.
Letter N or P is included in the model number, e.g. 244027NF, to denote gas type.
F = Frost protection.
Technical data is subject to change.

TYPICAL INSTALLATION – OUTDOOR LOCATION



CONNECTIONS – PLUMBING

All plumbing work must be carried out by a qualified person and in compliance with the Standard AS/NZS 3500.4 and all local codes and regulatory authority requirements.

All gas work must be carried out by a qualified person and in compliance with the Standard AS 5601 or AS/NZS 5601.1, as applicable under local regulations, and all local codes and regulatory authority requirements.

CONNECTION SIZES

Model	244 027
Hot water connection	R¾/20
Cold water connection	R¾/20
Gas inlet connection	R¾/20

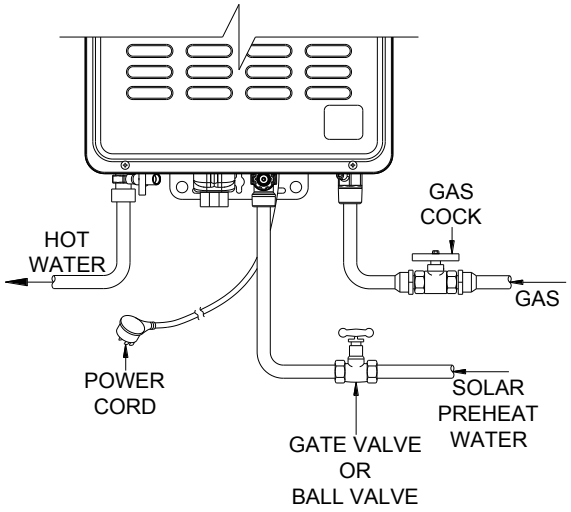
WATER INLET AND OUTLET

All pipe work must be cleared of foreign matter before connection and purged before attempting to operate the water heater. All olive compression fittings must use brass or copper olives. Use thread sealing tape or approved thread sealant on all fittings.

A full flow gate valve or ball valve must be installed on the cold water line or solar preheat water line to the water heater. **A non return valve or stop tap must not be installed.** An acceptable arrangement is shown in the diagram. Refer also to "Hot Water Delivery" on page 17 and to "Mains Water Supply" on page 16.

A disconnection union must always be provided at the cold water (solar preheat) inlet and hot water outlet on the water heater to allow for disconnection of the water heater.

Insulation used on the cold and hot water lines must extend up to the cold water (solar preheat) inlet and hot water outlet of the water heater.



In-series Gas Booster
Solar Preheat and Hot Water
and Gas Connection Details

Notes:

- It is essential all pipe connections be correctly aligned, otherwise component connections within the water heater may be strained and / or components themselves misaligned. It is recommended also, wherever possible, pipe connections be made at the water heater first and final pipe runs be made in soft copper pipe to allow some adjustment for misalignment.
- Use the spanner flats on the water heater fittings and take care to avoid twisting the water inlet and outlet pipes inside the jacket.
- The maximum supply temperature to the water heater when used as an in-series gas booster for a solar water heater should not exceed 80°C.

PIPE SIZES

The pipe sizing for hot water supply systems should be carried out by persons competent to do so, choosing the most suitable pipe size to ensure adequate flow for each individual application. Reference to the technical specifications of the water heater and local regulatory authority requirements must be made.

To achieve true mains pressure operation, the cold water line to the solar storage tank and from the solar storage tank to the in-series gas booster should be the same size or bigger than the hot water line from the water heater.

The minimum recommended solar preheat pipe and hot pipe size is DN20.

The pipe work between the solar storage tank and the in-series gas booster **MUST BE** of copper and be fully insulated with a closed cell type insulation or equivalent in accordance with the requirements of AS/NZS 3500.4.

The insulation must be weatherproof and UV resistant if exposed. The insulation must be fitted up to the connections on both the solar storage tank and the in-series gas booster. A full flow isolation valve must be installed on the water line to the in-series gas booster.

GAS INLET

The gas connection is made at the underside of the water heater. The pipe work must be cleared of foreign matter before connection and purged before attempting to operate the water heater. An isolation valve and disconnection union must be installed to allow servicing and removal of the water heater (refer to the diagram on page 22).

Note: Refer to the Gas Installations Standard AS 5601 or AS/NZS 5601.1 for the correct method of sizing the gas supply pipe to the water heater. The pipe size selection must take into account the high gas input of this water heater (refer to table on page 20) as well as all of the other gas appliances in the premises.

⚠ **Warning:** Always isolate the water heater before pressure testing the gas supply system. Disconnect the water heater after the isolation valve to prevent the risk of serious damage to the gas control. The Vulcan warranty does not cover damage of any nature resulting from failure to observe this precaution. Refer to rating label for gas types and pressures.

CONNECTIONS – ELECTRICAL

All electrical work and permanent wiring must be carried out by a qualified person and in accordance with the Wiring Rules AS/NZS 3000 and all local codes and regulatory authority requirements.

⚠ **Warning:** Temperature controllers **must not** be fitted to this water heater as part of a solar water heater system because water at a temperature much higher than the controller setting can be delivered.

The water heater is supplied with a 1.8 metre lead and plug and requires a weatherproof 240 V 50 Hz general purpose outlet (GPO) to be located within 1.2 metres of the installation. The GPO must be clear of the flue exhaust, draining water, gas supply pipe and water connections.

The power consumption of the water heater is:

Component	Power consumption	Comments
Gas booster	80 Watts	027 – Burner on, anti frost device inactive
	175 Watts	027 – Burner on, anti frost device active

The water heater will only operate on a sine wave at 50 Hz. Devices generating a square wave cannot be used to supply power to the water heater.

COMMISSIONING

All water heaters are tested and adjusted before dispatch from the factory, however further adjustments may become necessary because of local conditions.

TO TURN ON THE WATER HEATER

- Open all of the hot taps in the house (don't forget the shower).
- Open the cold water isolation valve fully at the inlet to the solar water heater.
- Open the solar heated water isolation valve fully at the inlet to the in-series gas booster.

  Air will be forced out of the taps.
- Close each tap as water flows freely from it.
- Check the pipe work for leaks.
- Open the gas isolation valve fully.
- Check the gas pipe work for leaks.
- Plug in the water heater at the power outlet and switch on the electrical supply.
- Open a hot tap.

  The water heater will operate automatically.
- Check to ensure the flow from each connected hot tap is sufficient to operate the water heater.

  The minimum operating flow rate for all models is 2.0 litres per minute.
- Check and if required adjust the preset outlet temperature setting of the water heater.

  Refer to "Preset Outlet Temperature Setting" on page 28.

The automatic water governor incorporated in the water heater is not adjustable.

To complete the installation, it is necessary to check the gas supply pressure at the inlet to the water heater (refer to "Gas Inlet Pressure" on page 25), the minimum test point pressure and the maximum test point pressure (refer to "Burner Gas Pressure" on page 27).

Explain to the householder or a responsible officer the functions and operation of the water heater and the solar water heater system.

⚠ **Warning:** Upon completion of the installation and commissioning of the water heater, leave this guide with the householder or a responsible officer. **DO NOT** leave this guide inside of the cover of the water heater, as it may interfere with the safe operation of the water heater or ignite when the water heater is turned on.

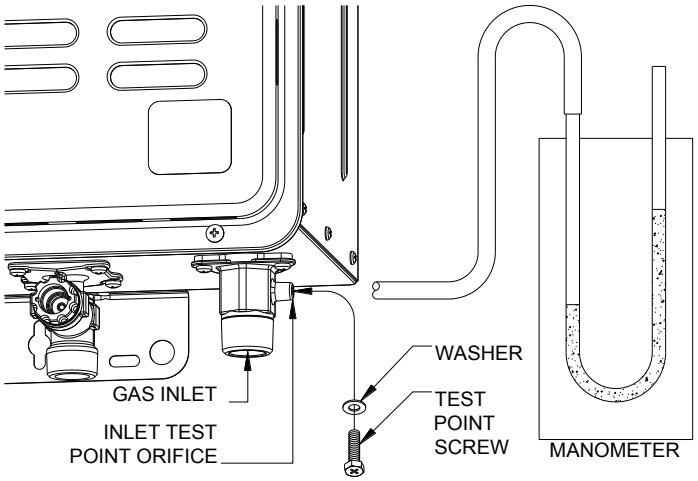
GAS INLET PRESSURE

IMPORTANT - CHECK the gas supply pressure at the inlet to the water heater with the water heater and all other gas burning appliances in the premises operating (burners alight). The minimum gas supply pressure is:

Natural Gas	1.13 kPa	Propane	2.75 kPa

If this minimum cannot be achieved, it may indicate the meter or the gas line to the water heater is undersized. It is important to ensure that an adequate gas supply pressure is available to the water heater when other gas burning appliances, on the same gas supply, are operating.

Gas Inlet Test Point Pressure
To check the gas inlet pressure:



1. Close any hot taps and ensure the burners are not operating.
2. Close the gas isolation valve at the gas inlet to the water heater.
3. Locate the gas inlet test point on the gas connection to the water heater.
   - Remove the test point screw and washer from the test point orifice.
   - Connect the manometer.
4. Open the gas isolation valve fully at the gas inlet to the water heater.
5. Observe the gas pressure reading on the manometer.

   If the manometer reading is between the minimum and maximum inlet gas pressure ratings on the rating label, no adjustment is required.

   If the manometer reading is below the minimum inlet gas pressure rating on the rating label, then either the gas pipe to the water heater is undersized and needs to be rectified or adjustment is required at the gas regulator.

   If the manometer reading is above the maximum inlet gas pressure ratings on the rating label, then adjustment is required at the gas regulator.
6. Switch on the electrical supply at the power outlet to the water heater if it is not already switched on.
7. Open a hot tap fully and ensure the burners are fully ignited.

   It may be necessary to open a second tap.
8. Turn on all other gas burning appliances in the house which are on the same gas supply.
9. Observe the gas pressure reading on the manometer.

   If the manometer reading is between the minimum and maximum inlet gas pressure ratings on the rating label, no adjustment is required.

   If the manometer reading is below the minimum inlet gas pressure rating on the rating label, then either the gas pipe to the water heater is undersized and needs to be rectified or adjustment is required at the gas regulator.

   If the manometer reading is above the maximum inlet gas pressure ratings on the rating label, then adjustment is required at the gas regulator.
10. Turn off the other gas burning appliances in the house.
11. If an adjustment was made during Step 9, repeat this procedure from Step 5.
12. Close the hot tap(s).
13. Close the gas isolation valve at the inlet to the water heater.
14. Remove the manometer and refit and tighten the test point screw and washer.
15. Open the gas isolation valve fully at the gas inlet to the water heater.
16. Open a hot tap again so the burners ignite.
17. Test for gas leaks.
18. Close the hot tap.

BURNER GAS PRESSURE

It is necessary to check the burner gas pressure at both the minimum and maximum operational settings. To check and if necessary adjust the operational gas pressures, the electrical supply to the water heater must be switched on, the burners ignited and hot water must be flowing from a hot tap.

⚠ **Warning:** The removal of the front panel will expose 240 volt wiring. Take care not to touch wiring terminals.

Note: The temperature of the water entering the in-series gas booster must be below 58°C, otherwise the gas burners will not ignite and the operational gas pressures cannot be measured.

Minimum test point gas pressure

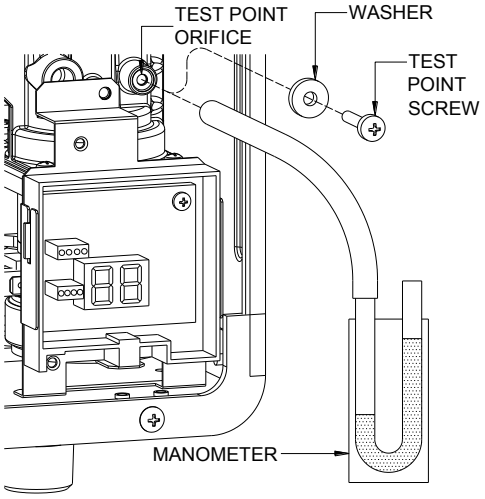
Refer to the rating label on the water heater for the minimum test point gas pressure.

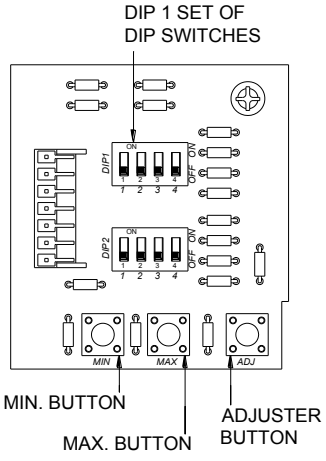
1. Close any hot taps and ensure the burners are not operating.
2. Switch off the electrical supply at the power outlet to the water heater.
3. Remove the screws holding the front panel to the jacket.
4. Gently disengage the front panel and pull forward to remove from the water heater.
5. Locate the burner pressure test point on the main burner manifold.
   - Remove the test point screw and washer from the test point orifice.
   - Connect the manometer.
6. Switch on the electrical supply at the power outlet to the water heater.
7. Open the gas isolation valve fully at the gas inlet to the water heater, if not already open.
8. Open a hot tap slowly until the burners ignite.
9. Press and hold down the MIN button and observe the reading on the manometer.
   - "1L" is shown on the LED display.
10. Release the MIN button.

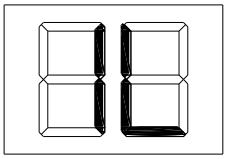
    If the manometer reading observed in step 9 agrees with the rating label, no further adjustment is required.
11. To adjust, press and hold the adjuster button.
    - "LH" is shown on the LED display.

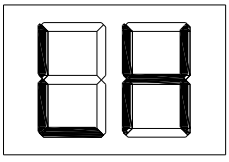
    Note: The adjuster button must be held down continuously through steps 11 to 13.
12. Press and hold the MIN button and observe the reading on the manometer.
    - The manometer reading will change as the test point gas pressure adjusts.

    Note: While the MIN button is pressed, the gas pressure will at first increase then decrease, cycling between an upper gas pressure limit (39 on the LED display) and a lower gas pressure limit (01 on the LED display).
13. Release the MIN button when the reading on the manometer agrees with the rating label.
14. Release the adjuster button.









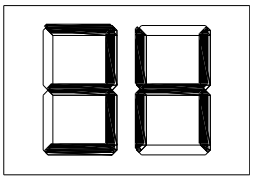
Notes:

- If the burners extinguish and error code 11 or 12 starts to flash on the LED display:
  - release the MIN and adjuster buttons
  - close the hot tap
  - clear the error code (refer to "Clearing Error Code" on page 28)
  - recommence the procedure from Step 8.
- If the adjuster button is released before Step 13, clear any error code (if displayed) and recommence the procedure from Step 8.

Maximum test point gas pressure
Refer to the rating label on the water heater for the maximum test point gas pressure.

Follow Steps 8 to 14 of the "Minimum test point gas pressure" procedure on page 27, but open the hot tap fully and use the MAX button instead of the MIN button. It may be necessary to open two or three hot taps fully, depending upon the model of water heater and the incoming cold water temperature.

Note: In Step 9, "3H" (027 models) will be shown on the LED display.



After setting the minimum and maximum test point gas pressures:

- Close the hot tap.
- Remove the manometer and refit and tighten the test point screw and washer.
- Open a hot tap again so the burners ignite.
- Test for gas leaks.
- Close the hot tap.
- Switch off the electrical supply at the power outlet to the water heater
- Refit the front panel and screws to the water heater.

Clearing Error Code
If an error code does appear on the LED display during the commissioning process, it will be necessary to clear the error in order to complete the installation. To clear an error code:

- switch off the electrical supply at the power outlet to the water heater
- check the gas isolation valve at the gas inlet to the water heater is fully open
- wait five (5) minutes
- switch on the electrical supply at the power outlet to the water heater

PRESET OUTLET TEMPERATURE SETTING
The factory preset outlet temperature setting of the in-series gas booster is 60°C. The preset outlet temperature setting can be adjusted (refer to "To Check or Adjust the Preset Outlet Temperature Setting" on page 29).

Note: AS 3498 requires that a water heater provides the means to inhibit the growth of Legionella bacteria in potable water. When this water heater is used as an in-series booster for a solar water heater it can satisfy this AS 3498 requirement provided it is energised, the booster preset outlet temperature setting is 70°C or higher, and that a remote temperature controller is not used.

Note: Consideration must be given to the delivery temperature to any ablution and public areas such as a bathroom, ensuite or public amenities. Refer to "Hot Water Delivery" on page 17 and to the schematics of Two Temperature Zones Using A Temperature Limiting Device on page 18.

TO CHECK OR ADJUST THE PRESET OUTLET TEMPERATURE SETTING

The temperature settings will be displayed on the LED display. The preset outlet temperature settings are:

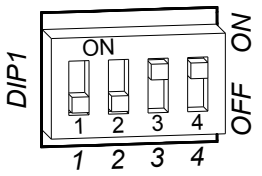
- 244 series 38°C, 40°C, 42°C, 43°C, 45°C, 50°C, 55°C, 60°C, 70°C, 75°C

It is necessary to have the electrical supply to the water heater switched on during stages of checking or adjusting the preset outlet temperature setting procedure.

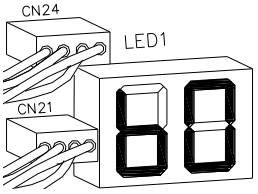
⚠ **Warning:** The removal of the front panel will expose 240 volt wiring. Take care not to touch wiring terminals. The adjustment must be carried out by a qualified person.

⚠ **Warning:** This procedure will involve the adjustment of dip switches. Adjustment of a dip switch should only be made with an insulated tool.

To check or adjust the preset outlet temperature setting:



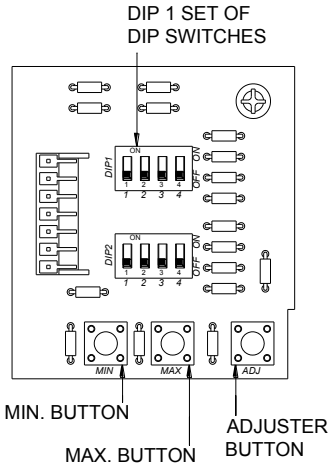
1. Switch off the electrical supply at the power outlet to the water heater.
2. Remove the screws holding the front panel to the jacket.
3. Gently disengage the front panel and pull forward to remove from the water heater.



4. Switch on the electrical supply at the power outlet to the water heater.
5. Switch dip switches 3 and 4 to the on (up) position on the DIP 1 set of DIP switches on the I.C. Board.

   The current preset outlet temperature setting will show on the LED display.

   If the temperature displayed on the LED display is the desired preset outlet temperature setting, then proceed to step 7, as no further adjustment is necessary.



6. Press the MAX button to increase or the MIN button to decrease the preset outlet temperature setting.

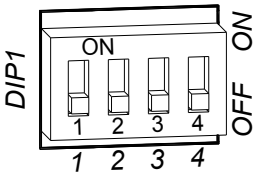
   Each press of the MAX or MIN button will increase or decrease the preset temperature by one increment.

   The MAX and MIN buttons are located underneath the DIP 1 and DIP 2 set of DIP switches.

   The increments are 38, 40, 42, 43, 45, 50, 55, 60, 70, 75.

7. Switch dip switches 3 and 4 to the off (down) position.

   The temperature display will go blank. The preset outlet temperature setting is now set.



8. Switch off the electrical supply at the power outlet to the water heater.
9. Refit the front panel and screws to the water heater.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then:

- Switch off the electrical supply at the power outlet to the water heater (refer to note below).
- Close the gas isolation valve at the inlet to the water heater
- Close the solar heated water isolation valve at the inlet to the water heater.
- Drain the water heater if there is a risk of freezing conditions occurring (refer to “Draining The Water Heater” on page 30).

Notes:

- The frost protection system will be rendered inoperable if electrical power is not available at the water heater.
- Damage caused by freezing due to the unavailability of power at the water heater is not covered by the Vulcan warranty (refer to “Terms of the Vulcan Warranty” on page 31).
- If the power has been switched off to the water heater and there is a risk of freezing, then it is necessary to drain the water heater (refer to “Draining the Water Heater” on page 30).

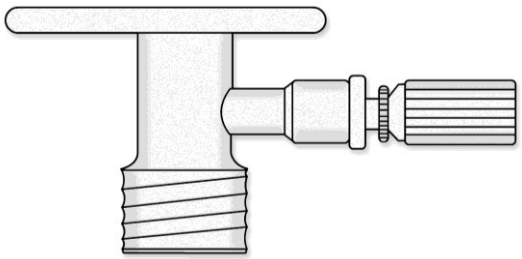
DRAINING THE WATER HEATER

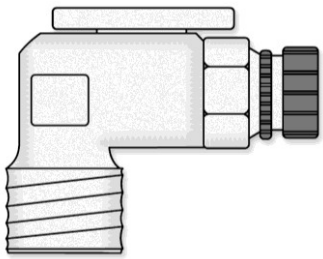
To drain the water heater:

- Turn off the water heater (refer to “Turn Off The Water Heater” on page 30).
- Open a hot tap (preferably the shower outlet).
- Unscrew the two drain plugs, one each at the solar heated water inlet and hot water outlet, on the underside of the water heater.

  Water will drain from the water heater.
- When water stops flowing from the water heater, close the hot tap.

Note: It is recommended not to screw the drain plugs back in, until the water heater is to be turned on again.





VULCAN CONTINUOUS FLOW GAS WATER HEATER WARRANTY - AUSTRALIA ONLY

CONTINUOUS FLOW GAS WATER HEATER 244 027 MODELS

1. THE VULCAN WARRANTY – GENERAL

1.1 This warranty is given by Rheem Australia Pty Limited ABN 21 098 823 511 of 1 Alan Street, Rydalmere New South Wales, the supplier of Vulcan continuous flow gas water heaters, manufactured by Paloma Co., Ltd., a world leader in water heater technology and manufacture.

1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the water heater subject to the terms of the Vulcan warranty. Rheem Service, in addition can provide preventative maintenance and advice on the operation of your water heater. The Rheem Service contact number is available 7 days a week on 131 031 with Service personnel available to take your call from 8am to 8pm daily (hours subject to change).

1.3 For details about this warranty, you can contact us on 131 031 or by email at warrantyenquiry@rheem.com.au (not for service bookings).

1.4 The terms of this warranty are set out in section 2 and apply to water heaters manufactured after 1st November 2011.

1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to water heaters manufactured after the date specified in the subsequent version.

2. TERMS OF THE VULCAN WARRANTY AND EXCLUSIONS TO IT

2.1 The decision of whether to repair or replace a faulty component is at Rheem's sole discretion.

2.2 Where a failed component or cylinder is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Vulcan warranty.

2.3 Where the water heater is installed outside the boundaries of a metropolitan area as defined by Rheem or further than 25 km from either a regional Rheem branch office or an Accredited Rheem Service Agent's office, the cost of transport, insurance and travelling between the nearest branch office or Rheem Accredited Service Agent's office and the installed site shall be the owner's responsibility.

2.4 Where the water heater is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors or walls and the cost of any special equipment to bring the water heater to floor or ground level or to a serviceable position is not covered by this warranty.

2.5 This warranty only applies to the original and genuine Vulcan water heater in its original installed location and any genuine Vulcan replacement parts.

2.6 If the water heater is not sized to supply the hot water demand in accordance with the guidelines in the Vulcan water heater literature, any resultant fault will not be covered by the Vulcan warranty.

2.7 The Vulcan warranty does not cover faults that are a result of:

a) Accidental damage to the water heater or any component (for example: (i) Acts of God such as floods, storms, fires, lightning strikes and the like; and (ii) third party acts or omissions).

b) Misuse or abnormal use of the water heater.

c) Installation not in accordance with the Owner's Guide and Installation Instructions or with relevant statutory and local requirements in the State or Territory in which the water heater is installed.

d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions.

e) Repairs, attempts to repair or modifications to the water heater by a person other than Rheem Service or a Rheem Accredited Service Agent.

f) Faulty plumbing or faulty gas or power supply.

g) Failure to maintain the water heater in accordance with the Owner's Guide and Installation Instructions.

h) Transport damage.

i) Fair wear and tear from adverse conditions (for example, corrosion).

j) Cosmetic defects.

k) Ice formation in the waterways of a water heater: where the electricity supply has been switched off or has failed and the water heater has not been drained in accordance with the instructions; or due to an ambient temperature below -20°C (including wind chill factor).

2.8 If you require a call out and we find that the fault is not covered by the Vulcan warranty, you are responsible for our standard call out charge. If you wish to have the relevant component repaired or replaced by Rheem, that service will be at your cost.

2.9 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for damage to furniture, carpet, walls, foundations or any other consequential loss either directly or indirectly due to leakage from the water heater, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure.

VULCAN CONTINUOUS FLOW GAS WATER HEATER WARRANTY - AUSTRALIA ONLY

CONTINUOUS FLOW GAS WATER HEATER 244 027 MODELS

3. WHAT IS COVERED BY THE VULCAN WARRANTY FOR THE WATER HEATERS DETAILED IN THIS DOCUMENT

3.1 Rheem will repair or replace a faulty component of your water heater if it fails to operate in accordance with its specifications as follows:

What components are covered	The period in which the fault must appear in order to be covered	What coverage you receive
All components	Year 1	Repair and/or replacement of the faulty component, free of charge, including labour.
All components (only if the water heater is installed in a single-family domestic dwelling)	Years 2 & 3	Repair and/or replacement of the faulty component, free of charge, including labour.
The heat exchanger (only if the water heater is installed in a single-family domestic dwelling)	Years 4 to 7	Replacement heat exchanger, free of charge. Installation and repair labour costs are the responsibility of the owner.

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

4.1 To be entitled to make a claim under this warranty you need to:

a) Be the owner of the water heater or have consent of the owner to act on their behalf.

b) Contact Rheem Service without undue delay after detection of the defect and, in any event, within the applicable warranty period.

4.2 You are **not** entitled to make a claim under this warranty if your water heater:

a) Does not have its original serial numbers or rating labels.

b) Is not installed in Australia.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

5.1 If you wish to make a claim under this warranty, you need to:

a) Contact Rheem on 131031 and provide owner's details, address of the water heater, a contact number and date of installation of the water heater or if that's unavailable, the date of manufacture and serial number (from the rating label on the water heater).

b) Rheem will arrange for the water heater to be tested and assessed on-site.

c) If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the water heater in accordance with this warranty.

5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

6. THE AUSTRALIAN CONSUMER LAW

6.1 Our goods come with guarantees that cannot be excluded under the *Australian Consumer Law*. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

6.2 The Vulcan warranty (set out above) is in addition to any rights and remedies that you may have under the *Australian Consumer Law*.

RHEEM AUSTRALIA PTY LTD
A.B.N. 21 098 823 511
www.rheem.com.au

FOR SERVICE TELEPHONE
131 031 AUSTRALIA
0800 657 335 NEW ZEALAND